

RCR FOCUS: GPS

Location, wireless technologies merge for business and safety

By Linda Kay Sakelaris

Location technology is taking its place in the wireless communications industry as Global Positioning System products begin to mesh with radio and cellular networks, spawning several potentially lucrative businesses.

A system of 24 satellites launched by the U.S. Department of Defense beginning in the late 1980s provides every spot on earth with a precise address. The satellites orbit the planet twice a day transmitting latitude, longitude and altitude information.

The GPS constellation was developed for U.S. military purposes but national policy requires that excess capacity be offered worldwide. No user fees are required.

Anyone with a GPS receiver can acquire position information for business applications including surveying, mapping, aviation, navigation,

transportation and more. Commercial GPS is a large and growing market expected to reach \$5 billion in annual equipment sales by 2000, according to Magellan Systems Corp. Other analysts predict the success of the technology will be even greater.

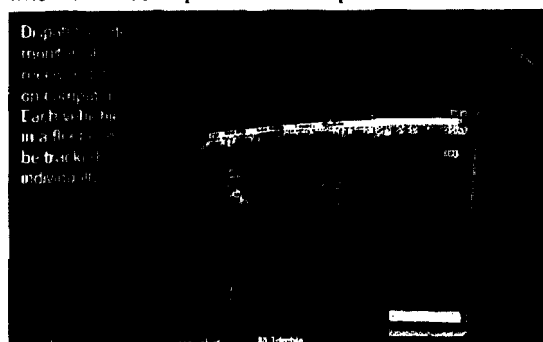
Not all companies interested in location tracking are using GPS. Some firms are launching their own satellite systems to do vehicle tracking, pipeline monitoring and other such applications.

Those are the same functions offered by many of the GPS products now entering the wireless marketplace.

In fleet tracking, GPS receivers peg the location and radio or cellular systems route the information to command centers for monitoring. Sweden-based radio manufacturer L.M., Ericsson jumped into vehicle location systems last year when it teamed with Trimble Naviga-

tion Ltd. Sunnyvale, Calif.-based Trimble manufactures GPS receivers and tracking display software products that work with Ericsson's Enhanced Digital Access Communications radio system. Ericsson has developed a ra-

the work. Dispatchers flip through the Windows-driven programs, clicking on ambulance icons moving across grids and maps. In 20 seconds, they know the precise location of every ambulance, the speed at which it is trav-



dio data interface to give users a plug-and-play connection, eliminating the need for custom hardware or software.

"The ability to incorporate AVL into a true voice or data trunking architecture allows agencies to use radio bandwidth more efficiently, as well as obtain real-time vehicle location information," said Tom Ellis, Trimble's vice president of tracking products.

American Medical Response of Colorado said it eliminated a great deal of its voice radio traffic by switching to a GPS system. AMR began constructing the system last November, first by dedicating a portion of its 800 MHz frequency to GPS, then by moving a repeater from the downtown Denver area north to El Dorado Mountain in Boulder, Colo.

"On the roofs of its 43 ambulances, AMR is installing GPS receivers about the size and shape of a sand dollar," said Paul Smith, AMR director of communications. Inside the vehicles, AMR has placed a Trimble GPS brain or status head device.

"We also have 800-band Uniden radios that work as frequency generators for GPS tracking. They have a fast attack time and pick up the frequencies to El Dorado. We poll five ambulances every second," he said.

A Computer Aided Dispatch program at the Denver command center does the rest of

eling and more. To dispatch an ambulance to an emergency, the command center sends the call to the vehicle's GPS brain, which contains a liquid crystal display screen. Just about every touch of the brain's button updates the vehicle's location, communicating its status in relation to the accident, Smith said.

"You can use GPS receivers and bundle different applications with that service, delivering the data collected through the circuit-switched network to a central location."

GPS also is used in paging and two-way radio networks to provide timing for simulcasting—broadcasting the same RF information on the same RF channel over multiple transmitters across vast geographic areas.

Charlotte, N.C.-based Glenayre Technologies Inc. offers a controller that uses GPS for high-speed simulcasting in paging networks. Ericsson Private Radio Systems in Lynchburg, Va., also has designed a simulcast product using GPS for two-way, public safety radio systems, which it plans to beta test in this year's second quarter.

"GPS is a highly accurate timing source," said Walt Sedlazeck, Ericsson's simulcast product manager. "With GPS, we are able to time stamp signals between the centralized source and remote sites, to compensate for the delay that typically occurs with the leased T-1 network."

Cellular operators can offer their analog networks for vehicle location service using one of several GPS products, including Trimble's GPS/Cellular Messenger system.

The device provides cellular operators with a way to sell economical fleet management applications. The Wireless Data Division of AT&T Wireless Services is working on a variety of solutions using GPS receivers and the data network.

"You can use GPS receivers and bundle different applications with that service, delivering the data collected through the circuit-switched network to a central location," said Andy Willett, business services marketing manager for AT&T Wireless Data.

The Messenger can be installed in any vehicle and supports a variety of data devices. GPS and cellular components are housed together, including an integral microcontroller. The Messenger can transmit GPS timing data as well as location information.

U.S. auto manufacturers are jumping into the act with on-vehicle GPS devices that integrate with the car's cellular phone. General Motors will offer the OnStar system on its 1997 Cadillacs later this year. The product integrates advanced vehicle electronic architecture with GPS and a cellular phone. OnStar links the vehicle with the OnStar customer assistance center for roadside assistance, emergency services, routing and location help.

Ora Electronics is promoting a GPS Telepath system, which plugs navigation assistance into a hands-free cellular system. The product includes a PC memory card with preprogrammed city information.

GPS could help 911 problems

By Linda Kay Sakelaris

Plugging a Global Positioning System receiver alone into a wireless phone won't solve the problem faced by 911 emergency operators receiving distress calls from cellular users.

"There's no one solution," said Bob Montgomery, network manager for the Cellular Telecommunications Industry Association.

"There are several location technologies that may be complementary. Carriers are looking for the technology that suits their environment," Montgomery said. GPS doesn't work in buildings or in tunnels, but it may be the right solution for some terrain, he said.

A coalition of 911-emergency associations asked the wireless industry to create standards that would solve the problem of emergency calls coming from cellular users who don't know their location. Landline, local phone networks are connected to the 911 emergency system in most U.S. metropolitan cities, so dispatchers immediately know the location of the phone being used in distress situations.

Not so with cellular phones. When wireless phones are turned on, they connect with the nearest cell site, which may not be in the county with the nearest emergency team, Montgomery said. Some callers know exactly where they are; some callers are lost or uncertain.

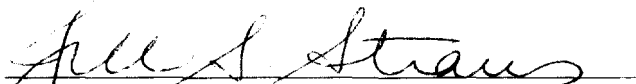
"The PSAP (Public Safety Answering Point) doesn't know where you are and doesn't know your phone number to call you back," Montgomery said.

GPS in a phone could be of some help because it can provide specific location coordinates, but it is likely that several technologies will be used together to solve this problem. Other location technologies being considered include time difference of arrival and direction of signal.

"You build a standard and then apply technology to that. You have to look at the big picture every time," Montgomery said.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing "Reply Comments of the Ad Hoc Alliance for Public Access to 911 Opposing Certain Provisions of the Consensus Agreement" were served this 12th day of March, 1996, by first class mail, postage prepaid, on the parties of the attached list.


Bill S. Straus

THE AD HOC TELECOMMUNICATIONS USERS COMMITTEE,
THE CALIFORNIA BANKERS CLEARING HOUSE AND
THE NEW YORK CLEARING HOUSE ASSOCIATION

c/o James S. Blaszak
Ellen G. Block
Levine, Blaszak, Block & Boothby
1300 Connecticut Avenue, N.W.
Suite 500
Washington, D.C. 20036

ADCOMM ENGINEERING COMPANY

c/o Joseph P. Blaschka, Jr., PE
14631 128th Avenue, N.E.
Woodinville, WA 98027

ALAMO AREA COUNCIL OF GOVERNMENTS

c/o Al J. Notzon III
118 Broadway, Suite 400
San Antonio, TX 78205

ALLTEL MOBILE COMMUNICATIONS, INC.

c/o Glenn S. Rabin
655 15th Street, N.W.
Suite 220
Washington, D.C. 20005

AMERICAN MOBILE TELECOMMUNICATIONS ASSOCIATION, INC.

c/o Elizabeth R. Sachs, Esq.
1150 18th Street, N.W.
Suite 250
Washington, D.C. 20036

ADCOMM ENGINEERING COMPANY

c/o Joe Blaschka
14631 128th Avenue, N.E.
Woodlinville, WA 98072

BELL ATLANTIC

c/o Betsy L. Anderson
1320 N. Courthouse Road, 8th Floor
Arlington, VA 22206

**BELLSOUTH CORPORATION,
BELLSOUTH TELECOMMUNICATION, INC.
BELLSOUTH ENTERPRISES, INC.
BELLSOUTH CELLULAR CORP.**

c/o Jim O. Llewellyn
115 Peachtree Street, N.E.
Atlanta, GA 30309-3610

C.J. DRISCOLL & ASSOCIATES

2066 Dorado Drive
Rancho Palos Verdes, CA 90275

CABLE PLUS

c/o Gary O'Malley
11400 S.E. 6th Street, Suite 120
Bellevue, WA 98004

COUNTY OF LOS ANGELES

c/o Thomas H. Bugbee
Telecommunications Branch
Information Technology Services
P.O. Box 2231
Downey, CA 90242

DEPARTMENT OF CORRECTIONS

c/o G. Kevin Carruth
Planning and Construction Division
P.O. Box 942883
Sacramento, CA 94283-0001

CONSTELLATION COMMUNICATIONS, INC.

c/o Robert A. Mazer
Albert Shuldiner
Vinson & Elkins L.L.P.
1455 Pennsylvania Avenue, N.W.
Suite 700
Washington, D.C. 20004-1008

PEOPLE OF THE STATE OF CALIFORNIA AND
THE PUBLIC UTILITIES COMMISSION OF THE STATE
c/o Ellen S. Levine
505 Van Ness Avenue
San Francisco, CA 94102

NATIONAL ASSOCIATION OF STATE
EMERGENCY MEDICAL SERVICES DIRECTORS
c/o Mark S. Johnson
EMS Communications Committee
1947 Camino Vida Roble
Suite 202
Carlsbad, CA 92008

CELLULAR NETWORKING PERSPECTIVES LTD.
c/o David Crowe
636 Toronto Crescent, NW
Calgary, Alberta T2N 3W1
CANADA

CELLULAR TELECOMMUNICATIONS
INDUSTRY ASSOCIATION (CTIA)
c/o Michael F. Altschul
1250 Connecticut Avenue, N.W.
Suite 200
Washington, D.C. 20036

CMT PARTNERS
c/o Adam A. Andersen
651 Gateway Boulevard, 15th Floor
South San Francisco, CA 94080

COMSAT CORPORATION
c/o Alicia A. McGlinchey
22300 Comsat Drive
Clarksburg, MD 20871

CONSUMERS FIRST AND THE AD HOC
ALLIANCE FOR PUBLIC ACCESS TO 911
c/o Jim Conran
P.O. Box 2346
Orinda, CA 94563

DEPARTMENT OF DEFENSE

c/o Paul R. Schwedler

Carl W. Smith

TELECOMMUNICATIONS, DOD

DEFENSE INFORMATION SYSTEMS AGENCY

Code DO1

701 S. Courthouse Road

Arlington, VA 22204

E.F. JOHNSON COMPANY

c/o Susan H.R. Jones

GARDNER, CARTON & DOUGLAS

1301 K Street, N.W.

Suite 900, East Tower

Washington, D.C. 20005

ELERT & ASSOCIATES

c/o Ed Hazelwood

140 Third Street South

Stillwater, MN 55082

ERICSSON CORPORATION

c/o David C. Jatlow

Young & Jatlow

Suite 600

2300 N Street, N.W.

Washington, D.C. 20037

ESPN AND ESPN2

c/o Edwin M. Durso

605 Third Avenue

New York, NY 10158-0180

FEDERAL HIGHWAY ADMINISTRATION

U.S. DEPARTMENT OF TRANSPORTATION

c/o Christine Johnson

400 7th Street, S.W.

Washington, D.C. 20590

HILLSBOROUGH COUNTY

OFFICE OF THE COUNTY ADMINISTRATOR

c/o B.J. Smith

P.O. Box 1110

Tampa, FL 33601

LAKE COUNTY INFORMATION SERVICES
E9-1-1 TELECOMMUNICATIONS

c/o Bruce E. Thorburn
P.O. Box 7800
Taveres, FL 32778-7800

NATIONAL EMERGENCY NUMBER ASSOCIATION (NENA)

c/o John Schroeder
8744 Government Drive
New Port Richey, FL 34654

GE CAPITAL-RESCOM

c/o Danny E. Adams
Ann M. Plaza
Wiley, Rein & Fielding
1776 K Street, N.W.
Washington, D.C. 20006

A.P.C.O.-GEORGIA CHAPTER

c/o James M. Dye
140 N. Marietta Parkway
Marietta, GA 30060

CITY OF MARIETTA EMERGENCY COMMUNICATIONS

c/o Robert L. Williams, Jr.
112 Haynes Street, Suite 911
Marietta, GA 30060

NATIONAL EMERGENCY NUMBER ASSOCIATION-
GEORGIA CHAPTER

c/o James M. Dye
140 N. Marietta Parkway
Marietta, GA 30060

GEOTEK COMMUNICATIONS, INC.

c/o Susan H.R. Jones
Gardner, Carton & Douglas
1301 K Street, N.W.
Suite 900, East Tower
Washington, D.C. 20005

GTE

c/o Andre J. Lachance
David J. Gudino
1850 M Street, N.W.
Suite 1200
Washington, D.C. 20036

HARRIS CORPORATION

c/o R. Daniel Foley
P.O. Box 1188
Novato, CA 94948-1188

HONG, SCOTT

667 Arbor Lane
Warminster, PA 18974

IDB MOBILE COMMUNICATIONS, INC.

c/o Robert S. Koppel
Richard S. Whitt
15245 Shady Grove Road
Suite 460
Rockville, MD 20850

ILLINOIS TELEPHONE ASSOCIATION

c/o John F. Tharp
P.O. Box 730
Springfield, IL 62705

INTERNATIONAL COMMUNICATIONS ASSOCIATION

c/o Brian R. Moir
Moir & Hardman
2000 L Street, N.W.
Suite 512
Washington, D.C. 20036-4907

INTERAGENCY COMMITTEE ON SEARCH AND RESCUE (ICSAR)

c/o Chairman Pennington
United States Coast Guard
2100 2nd Street, S.W.
Washington, D.C. 20593-0001

KENTUCKY EMERGENCY NUMBER ASSOCIATION (KENA)

c/o Jack Y. Sharp
1240 Airport Road
Frankfort, KY 40601

KSI INC.

c/o Charles J. Hinkle, Jr.
7630 Little River Turnpike
Suite 212
Annandale, VA 22003

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c/o David L. Nace
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Lukas, McGowan, Nace & Gutierrez
1111 19th Street, N.W.
12th Floor
Washington, D.C. 20036

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c/o Martha Carter
1144 Texas Avenue
Shreveport, LA 71101

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6776 Reisterstown Road
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C.J. Messerschmidt
Munsey Building
Calvert and Fayette Streets
Baltimore, MD 21202-1918

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1801 Pennsylvania Avenue, N.W.
Washington, D.C. 20006

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1350 I Street, N.W.
Suite 400
Washington, D.C. 20005

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P.O. Box 684
Washington, D.C. 20044

NATIONAL CELLULAR SAFETALK CENTER, INC.

c/o John Cusack
385 Airport Road, Suite A
Elgin, IL 60123

DEPARTMENT OF LAW AND PUBLIC SAFETY
STATE OFFICE OF THE ATTORNEY GENERAL

c/o George N. Rover
Hughes Justice Complex
CN 080
Trenton, NJ 08625-0080

NEXTEL COMMUNICATIONS, INC.

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Lawrence R. Krevor
800 Connecticut Avenue, N.W.
Suite 1001
Washington, D.C. 20006

NORTH AMERICAN TELECOMMUNICATIONS ASSOCIATION

c/o Albert H. Kramer
Robert F. Aldrich
Keck, Mahin & Cate
1201 New York Avenue, N.W.
Penthouse Suite
Washington, D.C. 20005-3919

NATIONAL EMERGENCY NUMBER ASSOCIATION

c/o Roy D. Meredith
P.O. Box 429
High Point, NC 27261-0429

EMERGENCY SERVICES ADVISORY COMMITTEE

c/o Lyle V. Gallagher
P.O. Box 5511
Bismarck, ND 58502-5511

NORTHERN TELECOM INC.

c/o Stephen L. Goodman
Halprin, Temple & Goodman
1100 New York Avenue, N.W.
Suite 650 East
Washington, D.C. 20005

NYNEX COMPANIES

c/o Edward R. Wholl
Jacqueline E. Holmes Nethersole
120 Bloomingdale Road
White Plains, NY 10605

911 ASSOCIATION OF CENTRAL
OKLAHOMA GOVERNMENTS

c/o Zach D. Taylor
Six Broadway Executive Park
6600 North Harvey Place
Suite 200
Oklahoma City, OK 73116-7913

OPASTCO

c/o Lisa M. Zaina
21 Dupont circle, N.W.
Suite 700
Washington, D.C. 20036

ORBITAL COMMUNICATIONS CORPORATION

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Halprin, Temple & Goodman
1100 New York Avenue, N.W.
Suite 650 East
Washington, D.C. 20005

**OREGON STATE POLICE EMERGENCY
MANAGEMENT DIVISION**

c/o David C. Yandell
595 Cottage Street, N.E.
Salem, OR 97310

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PACIFIC BELL MOBILE SERVICES**

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140 New Montgomery Street, Room 1525
San Francisco, CA 94105

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1019 19th Street, N.W.
Suite 1100
Washington, D.C. 20036

PERTECH AMERICA, INC.

c/o Michael J. Celeski
One Illinois Center
111 East Wacker Drive
Suite 500
Chicago, IL 60601

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c/o Philip G. Sailer
P.O. Box 812
Walker, MN 56484

PROCTOR

c/o O.C. Lee
15050 Northeast 36th
Redmond, WA 98052-5317

REDCOM LABORATORIES INC.

c/o Jerome S. Caplan
One Redcom Center
Victor, NY 14564-0995

RURAL CELLULAR ASSOCIATION

c/o David L. Jones
2120 L Street, N.W.
Suite 520
Washington, D.C. 20037

SIEMENS ROLM COMMUNICATIONS INC.

c/o Scott E. Wollaston, Esq.
P.O. Box 58075
Santa Clara, CA 95052-8075

SOUTHWESTERN BELL MOBILE SYSTEMS, INC.

c/o Bruce E. Beard, Esq.
17330 Preston Road, Suite 100A
Dallas, TX 75252

FOREST A. SOUTHWICK

107 Bent Twig Road
Easley, SC 29642-9523

SPRINGWICH CELLULAR LIMITED PARTNERSHIP

c/o Jean L. Kiddoo
Shelley L. Spencer
Swidler & Berlin
3000 K Street, N.W., Suite 300
Washington, D.C. 20007

STANFORD TELECOMMUNICATIONS, INC.

c/o Herman A. Bustamante
1221 Crossman Avenue
Sunnyvale, CA 94089-1117

STANFORD TELECOMMUNICATIONS, INC.

c/o Leonard Schuchman
1761 Business Center Drive
Reston, VA 22090

STARSYS GLOBAL POSITIONING, INC.

c/o Raul R. Rodriguez
Stephen D. Baruch
Leventhal, Senter & Lerman
2000 K Street, N.W., Suite 600
Washington, D.C. 20006

TELE-COMMUNICATIONS ASSOCIATION

c/o R. Michael Senkowski
Jeffrey S. Linder
Ilene T. Weinreich
Wiley, Rein & Fielding
1776 K Street, N.W.
Washington, D.C. 20006

TELECOMMUNICATIONS FOR THE DEAF, INC.

c/o Alfred Sonnenstrahl
8719 Colesville Road, Suite 300
Silver Spring, MD 20910

TELECOMMUNICATIONS INDUSTRY ASSOCIATION

c/o Dan Bart
2500 Wilson Boulevard
Suite 300
Arlington, VA 22201

TELIDENT, INC.

c/o Michael J. Miller
4510 West 77th Street
Suite 101
Minneapolis, MN 55435

CARTER COUNTY EMERGENCY COMMUNICATIONS DISTRICT

c/o Russell A. Hopkins
P.O. Box 999
Elizabethton, TN 37643

GREENE COUNTY EMERGENCY COMMUNICATIONS DISTRICT

c/o Pete Luttrell
111 Union Street
Greeneville, TN 37743

TERRAPIN CORPORATION

c/o David Kelley
11958 Monarch Street
Garden Grove, CA 92641

TEXAS ADVISORY COMMISSION ON
STATE EMERGENCY COMMUNICATIONS

c/o Dan Morales
P.O. Box 12548, Capitol Station
Austin, TX 78711-2548

GREATER HARRIS COUNTY
9-1-1 EMERGENCY NETWORK
c/o Laverne Hogan
602 Sawyer, Suite 710
Houston, TX 77007

NATIONAL EMERGENCY NUMBER
ASSOCIATION-TEXAS CHAPTER
c/o J. Ross Sherohman
P.O. Box 632911
Nacogdoches, TX 75963-2911

TRW, Inc.
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Daid S. Keir
Leventhal, Senter & Lerman
2000 K Street, N.W., Suite 600
Washington, D.C. 20006

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c/o Jeffrey S. Bork
1020 19th Street, N.W.
Suite 700
Washington, D.C. 20036

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c/o Peter M. Connolly
Koteen & Naftalin
1150 Connecticut Avenue, N.W.
Washington, D.C. 20036

UNITED STATES COAST GUARD
c/o J.D. Hersey, Jr.
2100 2nd Street, S.W.
Washington, D.C. 20593

UTC
c/o Jeffrey L. Sheldon
Thomas E. Goode
1140 Connecticut Avenue, N.W.
Suite 1140
Washington, D.C. 20036

ANACORTES POLICE DEPARTMENT

c/o Michael L. King
1011 12th Street
Anacortes, WA 98221

COWLITZ COUNTY TECHNICAL SERVICES CENTER

c/o Richard L. Bullock
312 S.W. First Avenue
Kelso, WA 98626-1724

**DEPARTMENT OF COMMUNITY, TRADE
AND ECONOMIC DEVELOPMENT**

c/o Robert G. Oenning
P.O. Box 48346
Olympia, WA 98504-8346

KING COUNTY E911 PROGRAM OFFICE

c/o Marlys R. Davis
700 Fifth Avenue, Suite 2300
Seattle, WA 98104-5002

KING COUNTY POLICE COMMUNICATIONS

c/o Captain John W. Beard
516 Third Avenue
Seattle, WA 98104-2312

PENINSULA COMMUNICATIONS

PORT ANGELES POLICE DEPARTMENT

c/o Naomi L. Wu
321 East 5th Street
Port Angeles, WA 98362

SAN JUAN COUNTY

c/o David L. Zeretzke
350 Court Street, #5
Friday Harbor, WA 98250

**THURSTON COUNTY DEPARTMENT
OF COMMUNICATIONS**

c/o James C. Quackenbush
2000 Lakeridge Drive, S.W.
Olympia, WA 98502

WASHINGTON TRACER

OREGON TRACER

c/o Arthur A. Butler

Sara Siegler-Miller

Ater, Wynne, Hewitt, Dodson & Skerritt

601 Union Street, Suite 5450

Seattle, WA 98101-2327

WATERWAY COMMUNICATIONS SYSTEMS, INC.

c/o Martin W. Bercovici

Keller and Heckman

1001 G Street, N.W.

Suite 500W

Washington, D.C. 20001-4545

WESTINGHOUSE ELECTRIC CORPORATION

Electronic Systems Group

c/o James Carlsen

P.O. Box 756 - MS A475

Baltimore, MD 21203